MORTON (T.S.K.)

CONDITIONS JUSTIFYING REMOVAL OF THE TESTICLE IN RADICAL OPERATIONS FOR INGUINAL HERNIA

WITH A REPORT OF THREE SUCCESSFUL CASES

BY

THOMAS S. K. MORTON, M.D.

PROFESSOR OF SURGERY IN THE PHILADELPHIA POLYCLINIC; OUT-PATIENT SURGEON TO THE PENNSYLVANIA HOSPITAL; ASSISTANT SURGEON TO THE ORTHOPEDIC HOSPITAL, ETC.

Read before the Philadelphia Academy of Surgery, March, 1894.

CONDITIONS JUSTIFYING REMOVAL OF THE TESTICLE IN RADICAL OPERATIONS FOR INGUINAL HERNIA; WITH A REPORT OF THREE SUCCESSFUL CASES.

By THOMAS S. K. MORTON, M.D.,

Professor of Surgery in the Philadelphia Polyclinic; Out-Patient Surgeon to the Pennsylvania Hospital; Assistant Surgeon to the Orthopedic Hospital, etc.

Fellows of the Academy of Surgery: Prior to making my remarks upon the above subject I desire emphatically to impress the fact that I am not here to advocate the indiscriminate sacrifice of an organ usually so highly prized as the testicle, but simply to point out certain of the conditions which would appear to me to justify the procedure and to relate three cases in which I have considered it best to resort to it. These cases represent the total number in which I have deemed it prudent to add ablation of the gland to formal procedures for the radical cure of inguinal hernia, for instances are rare in which this course may be considered justifiable, and must become constantly more and more so as radical procedures become perfected.

With the operations proposed by Bassini, Postempski, and Halsted, with their modifications, where the cord is displaced entirely from the inguinal canal, and, in the latter, even removed from the internal ring to an entirely new opening made for the purpose in the muscular structures of the abdominal wall; with these operations, I say, the presence of the cord has almost ceased to be a hindrance to seemingly ideal radical cure. Hence any temptation to sacrifice the testicle vanishes, and the conditions necessitating or permitting such removal become correspondingly more circumscribed.

Removal of the testicle in operations for inguinal hernia would, therefore, in my estimation, be practically limited to the following conditions:

1. Certain cases of undescended testicle.

Here, if the testicle had entered the canal and was degenerated or otherwise diseased, or could not be separated from the sac without endangering its vitality, or where it was manifestly functionless, it might be removed without reluctance. But if it were

normal, or almost normal in all respects save position, it would be best, if possible, to displace the cord from the canal by one of the modern methods and attempt to bring the organ into the scrotum and there fix it by sutures; or it might be pushed within the abdominal cavity through the internal ring, and there permitted to remain after close suture of the ring.

2. In some rare cases of congenital hernia.

Removal here must be very exceptionally called for with so many modern operative resources at hand.

3. In certain cases of chronic or acute disease of the testicle or cord complicating hernia demanding removal of the organ upon its own account.

4. In rare cases in which severe traumatism has occurred to testicle or cord during or before operation.

Accidental division of some or all of the vessels of the cord would not necessarily demand excision of the testicle unless other severe complications were present. Wounding or section of the vas deferens likewise might be consistent with retention of the organ. But where the gland has been stripped entirely from all other connections such injury to its vascular supply would produce so much danger of necrosis that ablation would become imperative.

5. In certain cases where sloughing of the sac or interrupted circulation of the cord or testicle has involved these latter structures in a suppurative or sloughing process.

6. Perhaps occasionally in the very aged, to simplify or shorten operation, or for some of the before-mentioned conditions of less degree than would justify the procedure in a younger individual.

There are no conditions, of course, except senility, that would excuse the removal of a testicle under circumstances where it was the sole reproductive gland possessed by the individual; even more rare would be the conditions justifying removal of both testicles in double herniæ.

Surgeons must be exceedingly cautious not to interfere with so highly valued a part without either a very clear understanding with the patient before witnesses (and preferably in writing) preliminary to the operation, or else be certain that the conditions for which the organ is removed will be convincing to others of the necessity for such removal. It is obviously important also for the operator to carefully preserve the specimens for his protection in case of dispute.

One word more of caution. It is not the easiest matter to tie off the testicular cord in such a manner as to leave it absolutely secure against recurring or secondary hemorrhage after its return to the abdominal cavity; and bleeding from it originates a pecu-

liarly dangerous form of shock quite independent of the amount of blood lost, which often is speedily fatal. Moreover, the bleeding will not be likely to cease spontaneously in the warm and moist peritoneal cavity to which the ligated stump has been returned, and operation to secure it more firmly (if diagnosis is made in time) would be a very formidable complication. Hence, excessive care must be exercised in its primary ligation. It should be transfixed and tied off in at least two portions. Silk is the only fit material for this purpose. A good button of tissue should be left above the ligatures, and, to be doubly sure, any apparent vessel ends should be separately ligated upon the end of the stump before it is returned to the cavity. Searing the stump with a cautery below the main ligatures would be equally, perhaps more, efficient than the separate ligatures to the vessel ends. If the cord were very large or œdematous it should be ligated in even smaller portions.

Case I. *Huge Strangulated Inguinal Hernia; Radical Operation with Removal of the Testicle; Recovery.*—Mr. M. C. B., a strong, healthy man of nearly fifty-seven years, strained himself fourteen years ago whilst pulling a heavy satchel across the floor. It caught on a splinter, and, as a result of straining to dislodge it while in a stooping position, he felt something give way in the left groin, and became exceedingly faint. Shortly after this a small, reducible but constantly reappearing tumor, came into the scrotum, and, as time went by, became gradually larger and larger.

Several years after the first appearance of the tumor, and when it had attained quite a large size, he became subject to occasional attacks of strangulation, which always required anæsthesia for reduction. Then, after one of these attacks, a large portion of the tumor became irreducible, and so remained. After this when the seizures came on strangulation could always be overcome by reduction of a portion of the hernial contents, but the entire tumor could never be reduced. Several more attacks of strangulation occurred at varying times after this, when more intestine would become prolapsed, but relief was invariably obtained upon reduction of the newly prolapsed and strangulated portion. While strangulation lasted his chief symptom was always an agonizing dragging pain at the epigastrium. By wearing a truss over the site of the external abdominal ring, that portion of gut which prolapsed and produced strangulation was more or less effectually kept up.

About 8 o'clock P.M., April 10, 1889, he felt the hernia slip out, and became a little faint and sick; but after lying down for a short time continued at his desk until midnight. At 1 o'clock A.M. he reached his home in West Philadelphia by street car and

foot from the city. His sensations were then different from anything that he experienced before, and he was certain that he was about to die—on similar occasions he had always been most confident and hopeful. At 3 o'clock A.M. he was seen by the late Dr. Michael Lampen, who always heretofore had been able to reduce the strangulation by taxis. The doctor, therefore, promptly placed the patient under anæsthesia, but was unable to reduce the tumor after an hour's application of taxis. He, however, could not let up the ether on account of the man's terrific sufferings. Ether narcosis, with an occasional application of taxis, had been kept up continuously from 3 A.M. until 8 A.M., when I saw the case in consultation. The patient's condition at the latter time was fairly good, but he was much depressed by the prolonged anæsthesia. No fecal vomiting had occurred.

Upon examination an enormous left-sided inguino-scrotal hernia was discovered. It was fully as large as a man's head; the skin covering it was exceedingly tense, shiny, and almost black from impeded circulation. Fluctuation was marked over the upper and outer portions of the tumor, whilst at that portion near the man's knees was present a large semi-globular boggy mass just beneath the skin.

Consent to operation having been obtained of the wife, taxis of a moment's duration was unsuccessfully employed, and operation at once proceeded with. Full aseptic measures prevailed throughout. A six-inch incision was made in the line of the tumor and inguinal canal, and carried down to the sac, which was punctured and torn to an equal extent. About a pint of brownish-tinged odorless serum escaped from the opening, and the small intestine at once came into view. This was highly distended with flatus, almost black, and in places ecchymotic. The constriction was then sought for and found to be at the external ring. This was incised upward, and the three feet of prolapsed small intestine was—after it had begun to assume a pinkish color—with some difficulty returned to the abdominal cavity, a healthy portion having first been pulled down at each extremity to make sure that no constriction existed at a higher or lower point. Attention was now turned to the remaining prolapsed mass. This had the appearance of being an enormously hypertrophied omentum, and was not in the slightest degree congested or strangulated. At first sight I took this mass for omentum, so great was its resemblance thereto, and it was only upon most careful examination that its true nature was revealed. It proved to be practically the entire colon, excepting possibly the cæcum, which could not be recognized in the confused mass, as well as the omentum attached. This discovery was made by finding, deep between two layers of fat, a band of fibrous material through which muscular fibres coursed,

and, later, by feeling a small fecal mass in the lumen. The bowel was absolutely collapsed, practically free from feces, and deeply buried in hypertrophied surroundings. The mesocolon also participated in these changes, and was likewise rendered almost indistinguishable by fat deposit. Only a longitudinal half-inch strip of bowel could anywhere be brought to sight. The epiploic appendages were enormous. (An illustration that it should be an invariable rule to cut or ligate nothing about a hernia until absolutely sure of its nature.) The mass was separated from its many adhesions to the sac, but, from its great size, after separation could not be reduced through the abdominal rings, although these were much dilated. Hence the incision was enlarged upward along the inguinal canal and the internal ring very freely divided upward upon the abdomen for a distance of several inches. The colon and omentum were then easily reduced, and attention turned to the sac. This was found universally adherent and particularly to the peri-testicular tissues. Its dissection was finally accomplished up to and within the internal ring, where it was cut off and the ends sutured together. I did not employ the method of dealing with the sac in this case that is advised by Macewen, because of the very large mass of perhaps devitalized tissue which would by that method have been returned to the abdomen. Where the sac is not very large, however, that procedure is quite a favorite with me.

The left testicle was elongated, hypertrophied, and so enveloped by the sac as to give it much resemblance to a prolapsed kidney, but examination quickly demonstrated its identity. After the sac had been dissected up it was found that the testicle was left without any vascular attachment excepting through the cord. Then arose the question whether it should be allowed to remain. This, again with the consent of the wife, was decided in the negative, for the following reasons: the organ was much hypertrophied and œdematous, and likely would require more blood than could be conveyed to it by the perhaps bruised and occluded cord; the patient was fifty-six years of age; the opposite testicle was apparently quite healthy and normal; and, finally, a much more certainly radical operation could be done by having the cord out of the wound. Again, had the organ been allowed to remain its life was by no means certain, and its necrosis might have made a very dangerous complication during convalescence. Hence the cord was ligated just below the internal ring and the testicle cut away. After being very certain that every vessel of the cord was firmly occluded by the ligatures, the pedicle was dropped within the abdomen. A glass drain-tube was placed in the extreme upper portion of the abdominal wound. Then a layer of deep sutures of chromic catgut were run along the muscular structure of the wound

down to the internal ring, through that structure and down along the canal to and embracing the external ring, thus giving a secure and accurate apposition of all the parts concerned in the hernial opening unimpeded by the presence of the cord. Were I doing this same operation to-day I would probably not introduce the tube at all, but if it were called for, would insert it through a separate median opening just above the pubis. However, in this case no harm resulted from leaving the upper portion of the wound weakened by a drain-tube orifice. The entire skin wound was next approximated by interrupted silk sutures and a double spica bandage applied over a copious dressing.

As soon as consciousness returned he was put upon powders of calomel one-tenth grain, and podophyllin one-sixth grain, every hour. These he took for twelve hours, and then was placed upon one-drachm doses of Epsom salts hourly. No food was permitted for twelve hours. Bowels moved very freely next morning with the assistance of an enema. From the time of coming out of the ether until the day following he was violently restless, pitching and tossing about the bed in an altogether uncontrollable manner. Somehow in the night he had, without the knowledge of those about him, managed to withdraw the drain-tube. This I found lying loose in the bed when I saw him early next day. The bowels by that time having freely moved and the belly being entirely flat, I determined not to replace the tube unless compelled to do so. Jactitation controlled by fifteen-grain doses of chloral.

April 15. Belly slightly distended. Still somewhat restless; for this more chloral. Bowels have again moved very freely. Temperature has not been above normal. Violent bronchitis present as result of the prolonged anæsthesia.

16*th*. Abdomen much swollen, nausea and non-fecal vomiting; complains much of pain; racking hiccough present; bowels not moved to-day. Decided to reinsert tube. Removed stitch at extreme upper portion of the wound and put glass drain-tube down to hollow of sacrum, and through it drew off two ounces of turbulent, bloody, non-odorous serum. Wound in excellent condition. Again put him on fractional doses of calomel and podophyllin. Bronchitis improving, but much purulent expectoration continues.

17*th*. Bowels freely open. Small amount of serous straw-colored fluid from tube. Hiccough and vomiting continue obstinately. For latter symptoms ordered cocain one-tenth grain, oxalate of cerium two grains, and bicarbonate of sodium two grains, every two hours.

18*th*. Vomiting and hiccough entirely under control. Bowels moved of their own accord, abdomen entirely flat and painless. Discharge had ceased, so tube was removed, as well as all skin sutures. Patient eating and sleeping well. Bronchitis almost gone.

On May 4th he sat up and began to get about; in two weeks more was at his business again.

When seen about a year after the operation there was present a firm cicatrix and no sign of return of the hernia. Up to the last time that I heard from him, several years afterward, he continued entirely free from return of the hernia. (*Transactions of the Philadelphia County Medical Society*, 1889, p. 206.)

Case II. *Large Strangulated Inguinal Hernia; Sloughing Intestine; Radical Operation, with Removal of Testicle; Recovery.*—Jacob B., aged forty-three years, was brought to me by his physician, Dr. James Robinson, on March 6, 1893, and admitted to the Polyclinic Hospital. He stated that he had had a large tumor in the left scrotum from childhood, and could not remember when it had originated. By manipulation at times he thought that it had become somewhat smaller. It never had given him any annoyance.

On March 1st, while in apparently perfect health, he drank a quantity of ice-water, which induced vomiting, during which he felt a "giving away" sensation in the left inguinal region. From this time he continued to vomit everything taken and to experience extreme nausea. Bowels also ceased to move. The tumor became more and more painful and swollen. He continued in this condition five days, and then summoned Dr. Robinson, who applied taxis for thirty minutes without making any impression on the mass. On the sixth day he walked a number of squares to the hospital.

Upon admission I found a tumor the size of a large cocoanut occupying the left scrotum and inguinal canal. The testicle was below the general mass, and could be outlined as distinct from it. The whole tumor was very tender and somewhat œdematous. Deep fluctuation was marked. No percussion resonance, or succussion. A very resisting mass occupied the inguinal canal. Bowels had not moved for six days. Constant fecal vomiting. Condition very fair.

A diagnosis of chronic hernia of the omentum, with acute entanglement of a portion of the intestine, together with hydrocele of the hernial sac, was made, and immediate operation insisted upon.

After preliminary cleansing and anæsthesia, without waiting to make prolonged taxis, which was clearly prohibited by the long duration of the strangulation (as the subsequent history clearly demonstrated), a five-inch incision was made in the line of the inguinal canal and scrotum. The cellular tissues were œdematous and had some odor of decomposition. The sac was exceedingly thick and highly discolored, as if about to break down. It was freely incised, and half a pint of dark, turbid fluid of putrefactive

odor escaped. The sac contained a large mass of hypertrophied omentum of the character so frequently found in omental hernias; it was adherent by firmly organized attachments to most of the sac-wall. It was purple in color, intensely congested, and very œdematous. The whole was stripped from its adhesions and carefully spread out, whereupon a portion of small intestine came into view that had been entirely wrapped up in the folds of the omentum. This again illustrates the extreme care that is always so necessary in handling the contents of a rupture; for it would have been exceedingly easy to have ligated off the omentum and bowel together in this case, and to have returned the stump to the abdomen, thus insuring a fatal issue. A finger passed into the inguinal canal discovered a very tight constriction at the internal ring, which was freely divided upward. The omentum could now be pulled down with ease until entirely healthy portions appeared, where it was ligated off in two bundles by transfixion, and the stump returned to the cavity and fixed immediately behind the internal ring by bringing both of the ligature ends through different portions of the muscular wall and then tying them down as suggested by Macewen for making a protecting pad of the sac in his radical operation. The prolapsed intestine could now be freely inspected.

Upon the free margin was a gangrenous spot one-half inch in diameter, which appeared to be in imminent danger of rupture. The remaining portions of intestine were almost black from venous stasis, but were not actually sloughing. The sloughing portion was buried under healthy peritoneum by means of Lembert sutures; buckled into the lumen of the bowel, as it were, just as if perforation had taken place. Fortunately, this procedure did not too much diminish the lumen of the bowel; and by the time that it was completed all excepting the sloughing portions of the intestine had, under hot irrigation, resumed the beautiful pink tint of returning circulation. The bowel was then returned to the abdominal cavity.

After a very difficult dissection the sac was freed of its attachments to the scrotal, testicular, and cordal tissues, and ligated off in two sections at the internal ring. The stump of omentum was next fixed behind the ring as described. Attention was now turned to the testicle and cord. These structures were œdematous, had the general foul odor of all the surroundings, and, in spite of careful separation, had been considerably injured by the dissection and other manipulations. It was considered that leaving such structures in a wound already gravely threatened with suppuration, if not sloughing, was an unjustifiable risk to which to subject the patient, as the testicle, under these circumstances, was likely to break down and slough with accompanying dissecting suppura-

tion, and especially was it desirable to secure for this hard-working man a radical cure if possible. Hence the cord was ligated at the internal ring most carefully by a transfixing double ligature of silk and also returned to the abdomen. This permitted a careful and complete closure of the internal ring and the whole inguinal canal by buried silkworm-gut sutures placed about three-eighths of an inch apart. A small rubber drain was placed in the lower portion of the scrotal wound, but none in the upper portion, and the skin margins approximated by silk sutures.

Excepting a small amount of suppuration in the scrotum, the entire wound healed by primary intent. The drain was removed on the third day. The bowels moved within twenty-four hours spontaneously, and naturally each day thereafter. There were some small clots of blood in the first stool, but none subsequently. He was given absolutely nothing by mouth for thirty hours subsequent to the operation; but rectal enemata of warm water were frequently administered, which prevented thirst. Then liquid diet was started and full diet gradually resumed. He was kept in bed three weeks, and resumed his duties as a hotel waiter in five weeks. He was instructed not to wear a truss.

I last saw this man on November 2, 1893. There was no sign of return of the hernia. The cicatrix was sound. He has been working hard at his occupation ever since the operation, has not worn a support, and expressed himself as stronger and better in every way than he had been for years.

Case III. *Strangulated Congenital Inguinal Hernia; Radical Operation, with Removal of Undescended Testicle; Recovery.*—Irvin B., aged nineteen years, was admitted to the Polyclinic Hospital, May 9, 1893. He has enjoyed excellent health all his life, but always has had a "come-and-go" tumor in the right scrotum, and has never been able to distinguish a testicle upon that side. The opposite testicle is large and firm. The tumor could always be reduced with ease, and likewise disappeared whenever he laid down. It was painless. He had never worn a truss.

On the morning of May 8th, upon slight straining while at his work of tile-setting, he felt a painful and unusual sensation in the right side of the scrotum, and went home, nauseated and in great suffering. He then discovered that a tumor much larger than usual was present, and that it was tender and irreducible. The bowels moved a few hours subsequently.

On May 9th he applied to me for relief, and I insisted upon his entering a hospital. No movement of bowels except shortly after strangulation. Much nausea and anorexia, but no actual vomiting had taken place. Belly somewhat distended, but general condition good. In the right inguinal region was a tumor of considerable proportions and very sensitive. Fluctuation was very marked

in the dependent portion of the scrotum. No succussion; no percussion resonance. Inguinal canal tense and occupied by a solid mass. Testicle could not be defined.

The man was given a bath upon admission, and, consent to removal of the undescended testicle having been secured, immediately etherized. Taxis was then made for five minutes, and failed. Immediately upon failure of taxis a long incision was made over the inguinal canal and tumor and carried down through the tissues until a thin-walled sac was freely exposed. This was also incised, and four ounces of brownish serum escaped, disclosing a web of congested omentum and about four inches of small intestine. The omentum was inky black, the intestine not quite so much injected. A very small and tight constriction was found at the internal ring. This was divided by a Cooper hernia knife with considerable difficulty, incident to the high location of the ring and to the intense constriction—bowel as well as sac overlapping on all sides. A small rent in the serous covering of the bowel resulted, but was immediately repaired with a half-dozen Lembert sutures. I have since learned to cut the ring from above in all difficult cases, and thus to avoid the risks of wounding the bowel or other structures passing through the ring. As a division of the ring and roof of the canal from above is now an established procedure when making radical cures for hernia in this situation, division of the ring from below may go entirely out of fashion excepting in desperate cases or in those of the very aged or feeble, where radical operations must be ruled out owing to the increased danger to life inseparable from prolonged operative manipulations.

So soon as the constriction was relieved the bowel and omentum at once resumed their normal color and circulation. The omentum was ligated off in portions and the stump returned to the abdominal cavity. More intestine was then pulled down, as usual, but no further constriction found, and it was also returned to the cavity.

In the sac wall at the position of the external abdominal ring was found an undeveloped undescended testicle about half an inch long and three-eighths of an inch wide. This was dissected out with a portion of the sac, the pedicle securely ligated, the testicle cut away, and the stump returned to the peritoneal cavity. It could have been reduced with the sac, but could not have been returned to the scrotum with a cord manufactured out of a portion of the sac-wall including the testicular vessels and vas deferens. When I considered the uselessness of the organ in its undeveloped condition, its well-known propensity to degenerations and other diseased conditions, and, moreover, as I had secured his consent to its removal, and could make so much better a radical operation with no structure traversing the rings or inguinal canal, it appeared more than justifiable to sacrifice the organ, especially as its fellow

was in perfect condition. The sac (containing the pedicle of the cord) was next dissected free from its surroundings up to and a little within the internal ring. Here it was puckered up after the method of Macewen with a thread and needle and fixed just behind the internal ring, to act as a pad to protect that region from the possible return of a portion of gut. The internal ring and inguinal canal were then completely obliterated by silk sutures and the skin likewise sutured by silkworm-gut. No drainage was employed. His bowels were moved by fractional doses of calomel and podophyllin within twenty-four hours, and in three days he was eating semi-solid diet. The wound healed throughout by primary union. He was kept upon his back for three weeks and resumed his occupation in five weeks. No truss was prescribed.

I have seen this patient recently—almost one year since the operation—and found the cicatrix sound, with no sign of return of hernia.